

REMARKS

In view of the above amendments and following remarks, reconsideration of further examination are requested.

By the current amendment claims 21 and 32 have been amended to further distinguish the invention from Fossey et al. and Ravid et al.

In this regard, claims 21 and 32 now recite methods, respectively, for inspecting a semiconductor wafer surface that comprise *inter alia*

scanning a semiconductor wafer with a laser beam directed perpendicularly to said semiconductor wafer . . . detecting at least one of scattered and reflected light from a surface of said semiconductor wafer by multiple light optics having different detecting angles, respectively, relative to said laser beam, wherein at least one of said multiple light optics is a high-angle light optic having a detecting angle that is from 5° to 20° relative to said laser beam and at least another of said multiple light optics is a low-angle light optic having a detecting angle that is from 25° to 75° relative to said laser beam.

Such methods are not taught or suggested Fossey et al. or Ravid et al. either taken alone or in combination.

In this regard, in Fossey et al., the laser beam is directed at an angle of about 40° with respect to the workpiece, and is not "directed perpendicularly" to the workpiece as is now recited in each of claims 21 and 32. Accordingly, claim 21 is not anticipated by Fossey et al. Ravid et al. does not resolve this deficiency of Fossey et al. In this regard, while Ravid et al. does disclose directing a laser beam perpendicularly to a workpiece, the detectors 26-29 are arranged orthogonally to the laser beam, and thus the detecting angles as now recited in claims 21 and 32 are not taught or suggested by Ravid et al.

Also, in Ravid et al., lengths in the X and Y directions are observed only from the side of the workpiece, and no attempt is made to obtain information regarding a height direction in Ravid et al. To the contrary, in the present invention, data concerning an area of a projection of a detected object

on a wafer surface is presumed from intensity data obtained with a high-angle light detector, while data concerning a height direction (Z) of the detected object from the wafer surface is presumed from intensity data obtained with a low-angle light detector, so as to classify the defect.

In Ravid et al., defects on the wafer surface during or after element manufacturing on which a pattern is formed are classified into pattern type defects, scratch type defects and particle type defects. Relatively large defects of several μm or more are the target, and small defects present on a surface of a mirror-polished wafer are not the target as with the present invention.

In Ravid et al., a comparison between the total number of pixels detected by multiple detectors and the sum of intensities of all the pixels (volume of collected light vs. intensity) is conducted, while in the present invention, a comparison between intensities or between sizes detected by multiple detectors within one pixel having a maximum intensity is conducted. The principles of detection of Ravid et al. are completely different those of the instant invention.

In Ravid et al., examination of asymmetry relative to linearity attributes is conducted, but such is not applied to micro-scratches because of its unreliability. On the other hand, with the instant invention, micro-scratches can be divided.

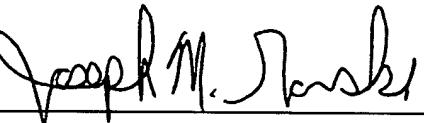
In view of the above, it is respectfully submitted that any combination of Fossey et al. and Ravid et al. would not result in the invention as recited in either of claims 21 and 32. Thus, claims 21-45 are allowable over Fossey et al. and Ravid et al. either taken alone or in combination.

In view of the above amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and an early Notice of Allowance is earnestly solicited.

If after reviewing this Amendment, the Examiner believes that any issues remain which must be resolved before the application can be passed to issue, the Examiner is invited to contact the Applicants' undersigned representative by telephone to resolve such issues.

Respectfully submitted,

Yoshio YANASE et al.

By: 
Joseph M. Gorski
Registration No. 46,500
Attorney for Applicants

JMG/krl
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
September 3, 2003

THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEES FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-0975